



ARISTOTLE: A Multihazard All-Risk Integrated System Toward Transboundary Holistic Early Warning

Neil Armstrong, Deputy Chief Meteorologist

With special thanks to Jenny Rourke, Gavin Iley, Anton Muscat, the ERCC and all of the ARISTOTLE members.



ARISTOTLE:
All Risk
Integrated
System TOwards
Trans-boundary
hoListic Early-
warning



What is ARISTOTLE?

Emergency Response Coordination Centre (ERCC)

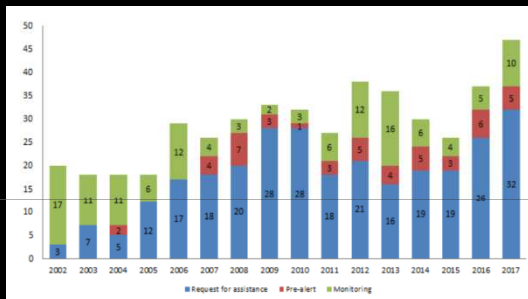


The Emergency Response Coordination Centre supports and coordinates a wide range of prevention and preparedness activities, from awareness-raising to field exercises simulating emergency response. © Ezequiel Scagnetti

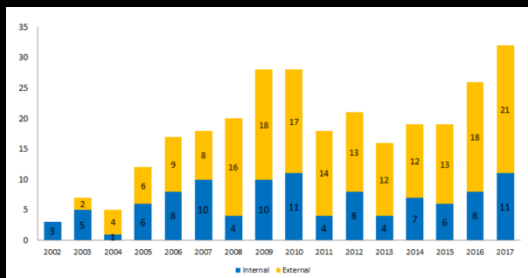


Met Office

Number of operations of the EUCP Mechanism

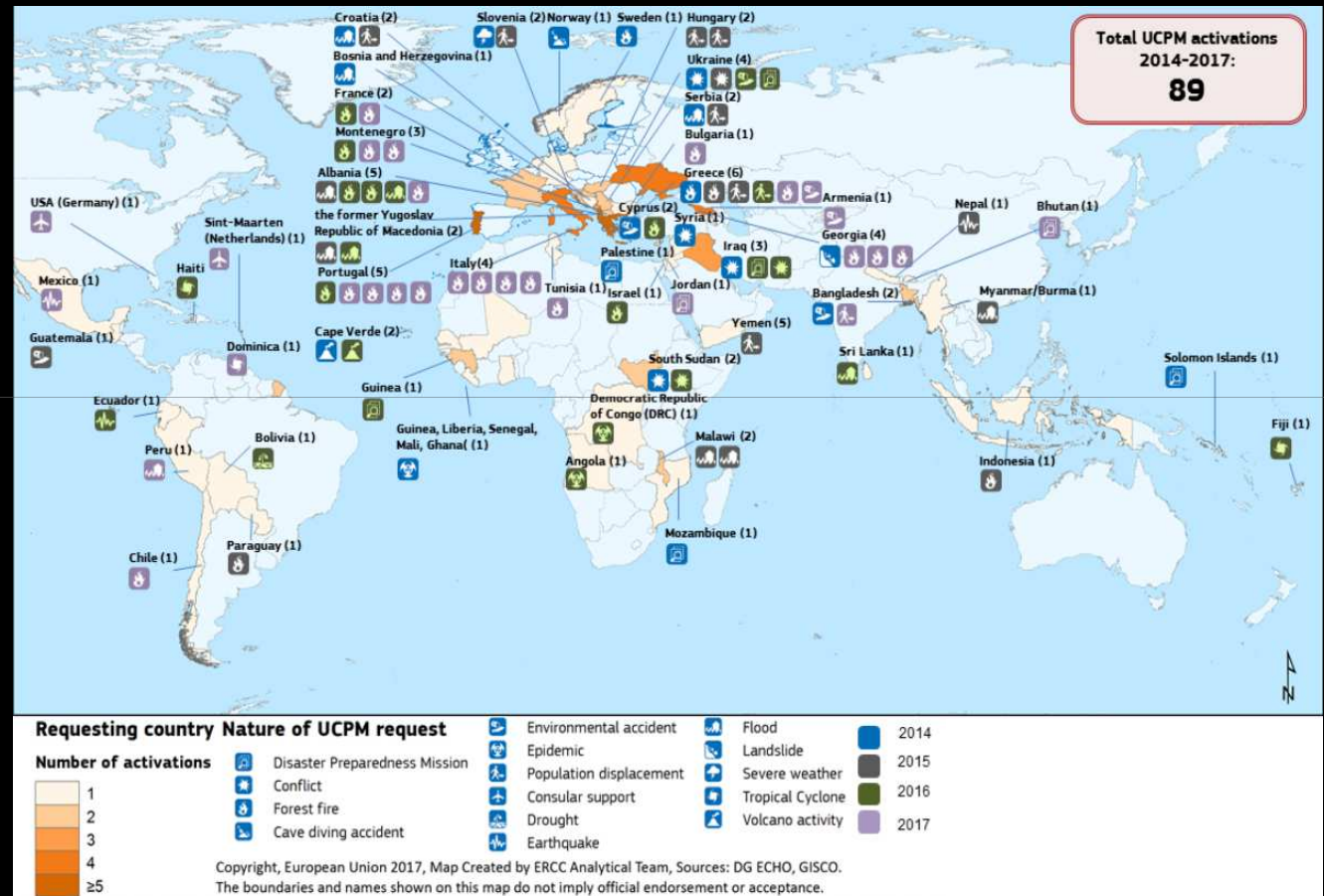


Requests for assistance inside and outside EU



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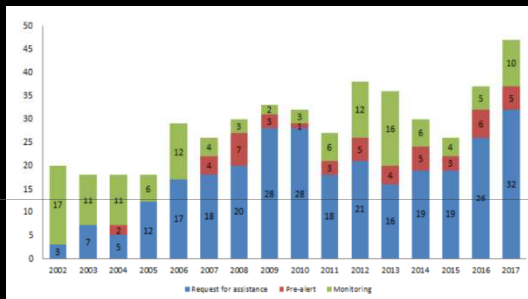
What is ARISTOTLE?



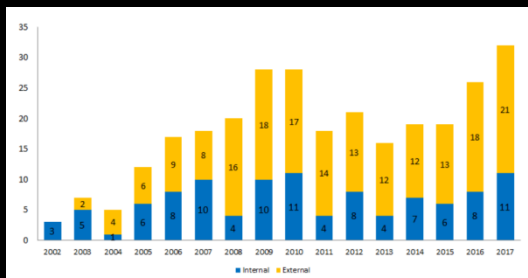


Met Office

Number of operations of the
EUCP Mechanism



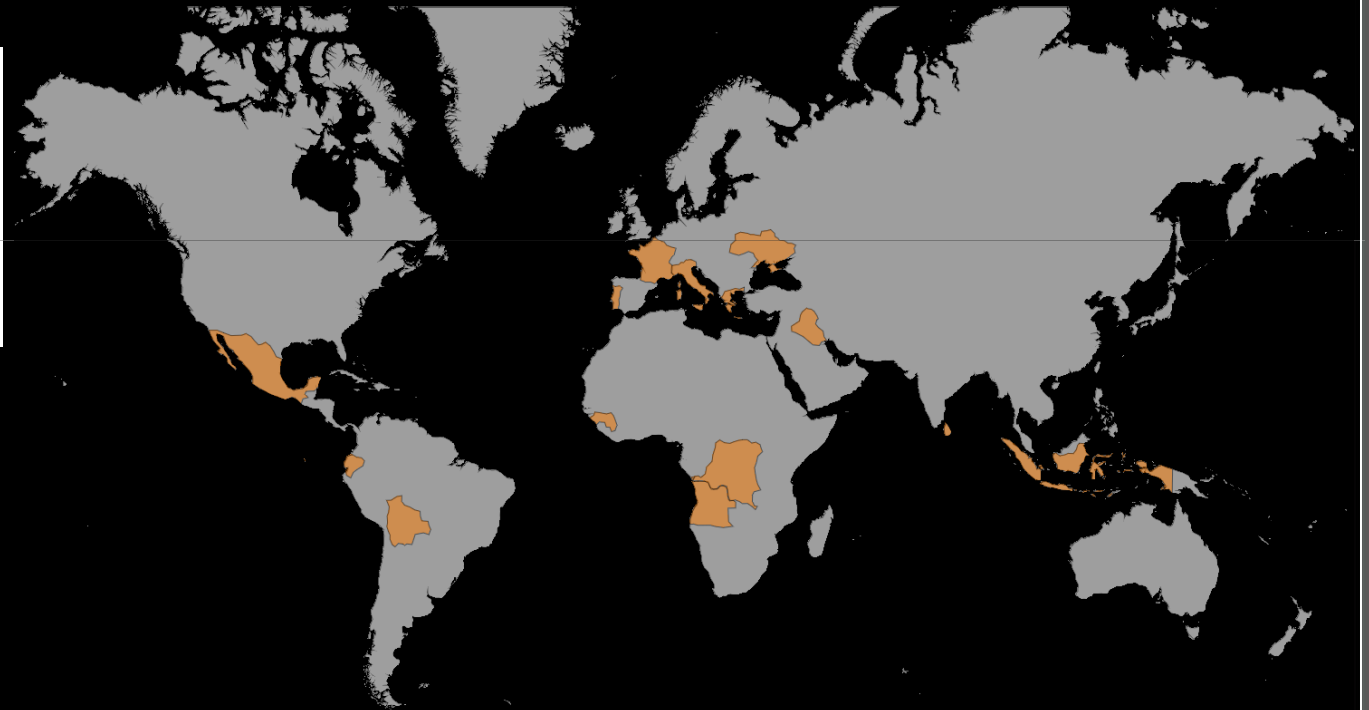
Requests for assistance inside
and outside EU



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What is ARISTOTLE?

32 activations in 2017



* Source : ERCC Operations CEOS WG March 2018

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UKMO



FMI



KNMI



ZAMG



IPMA



SMHI



ECMWF



INGV



BGS



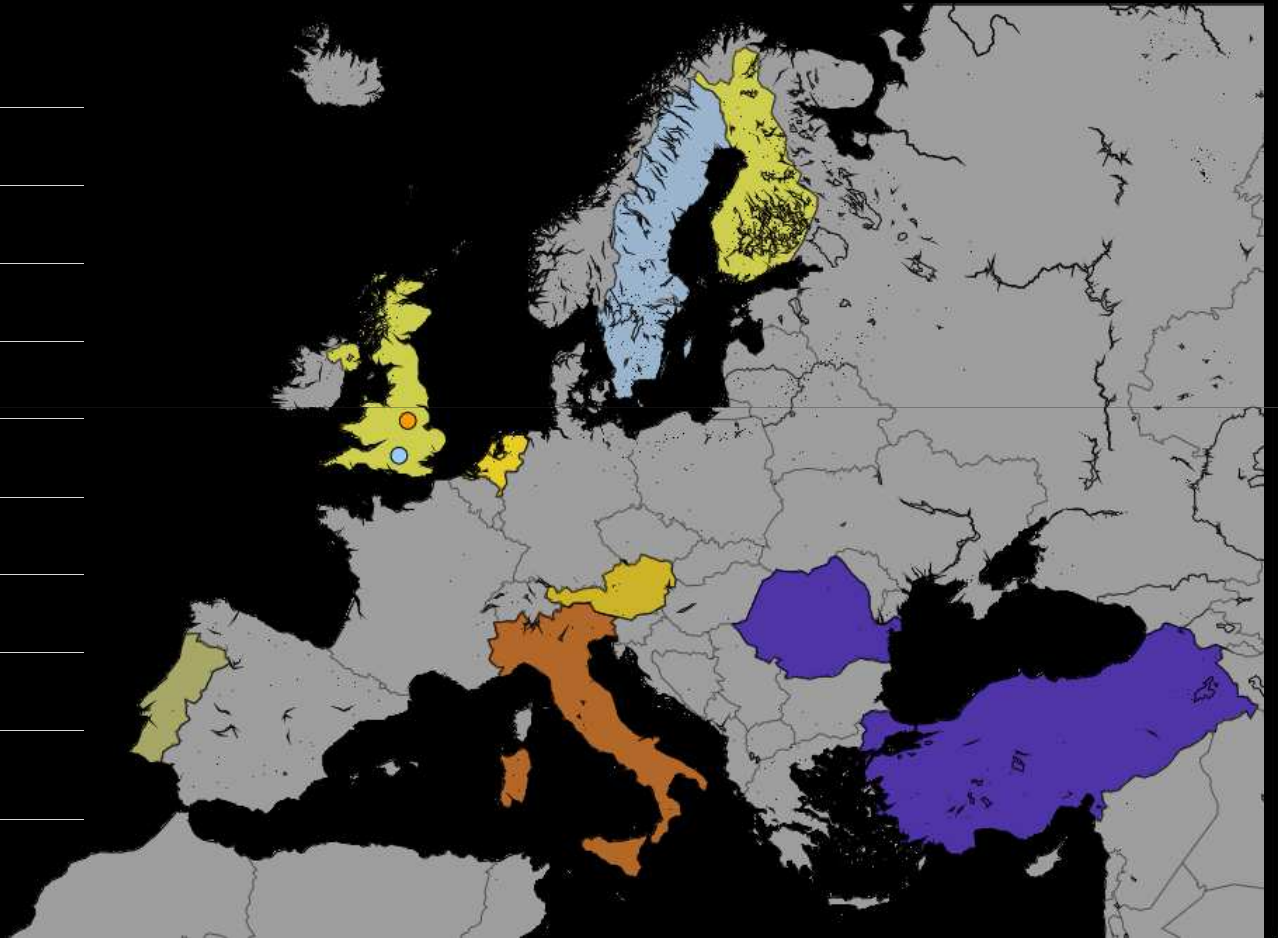
NIEP



KOERI



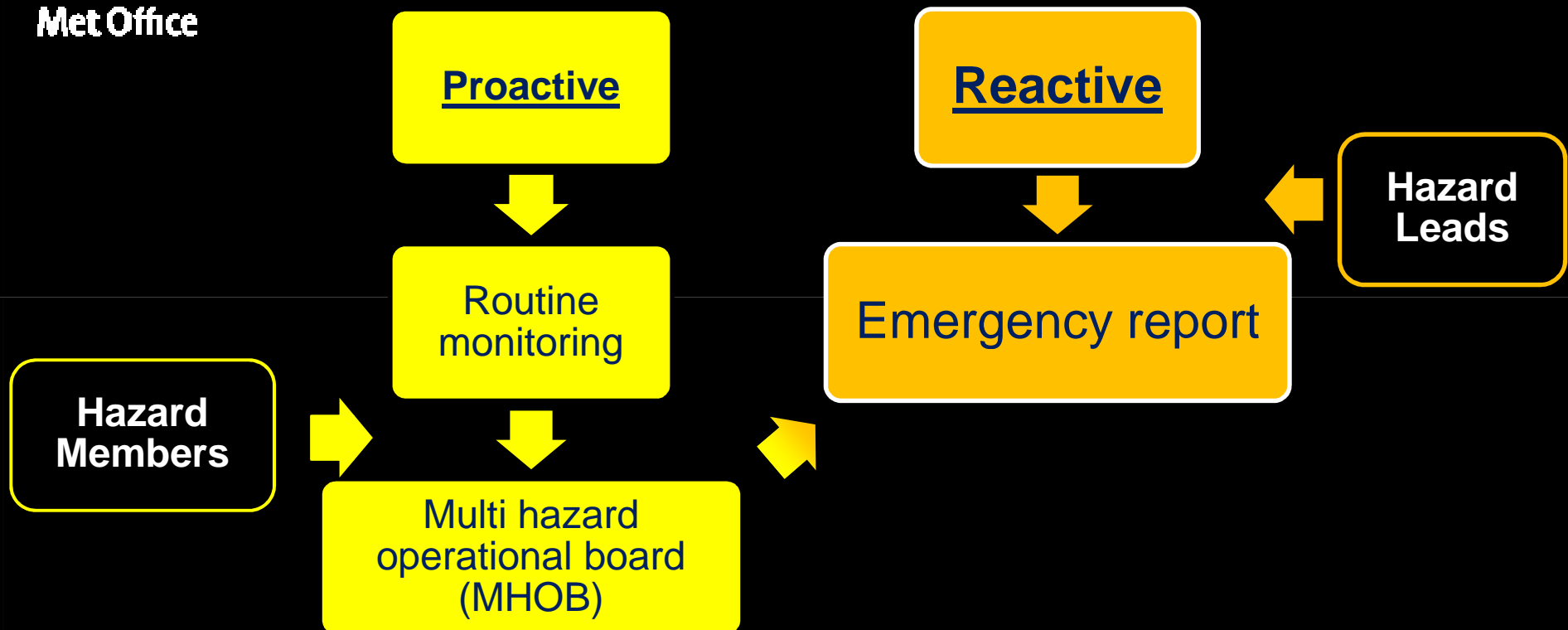
What is ARISTOTLE?





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What is ARISTOTLE?

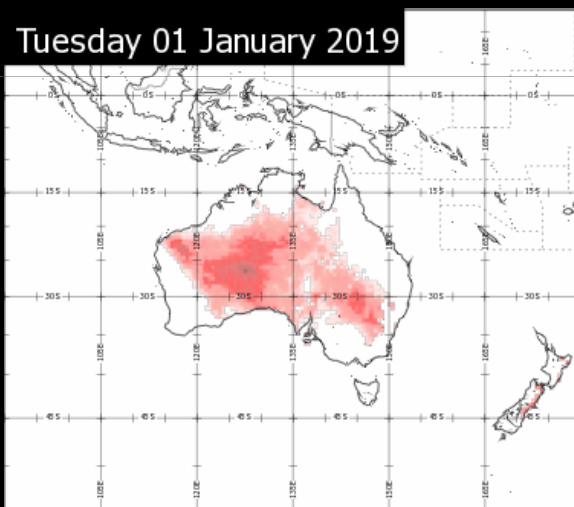


Severe Weather Daily monitoring

Multi-model ensemble based impact forecasts

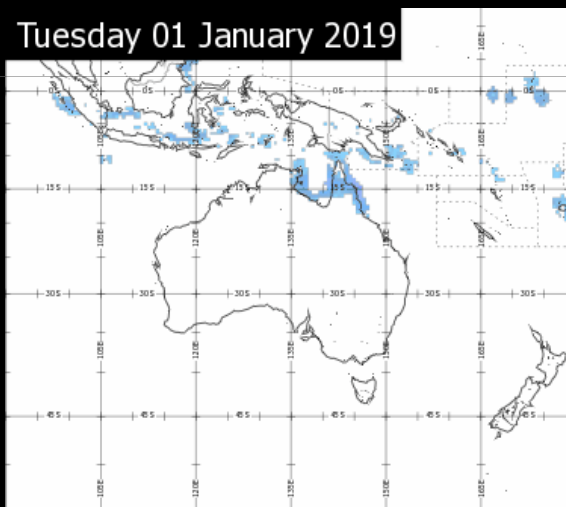
Hot – cold waves

Tuesday 01 January 2019



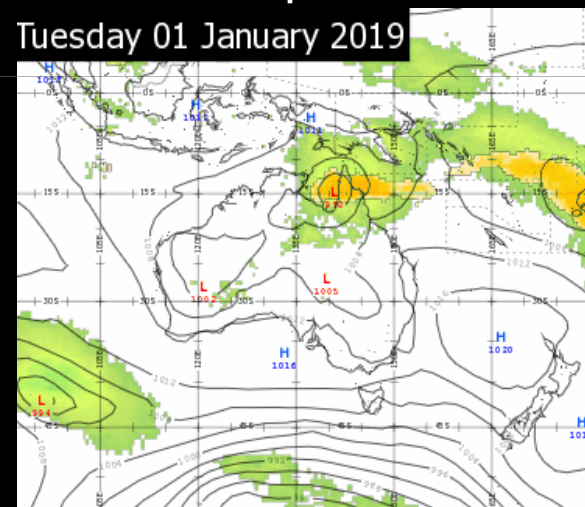
Rain - snow

Tuesday 01 January 2019



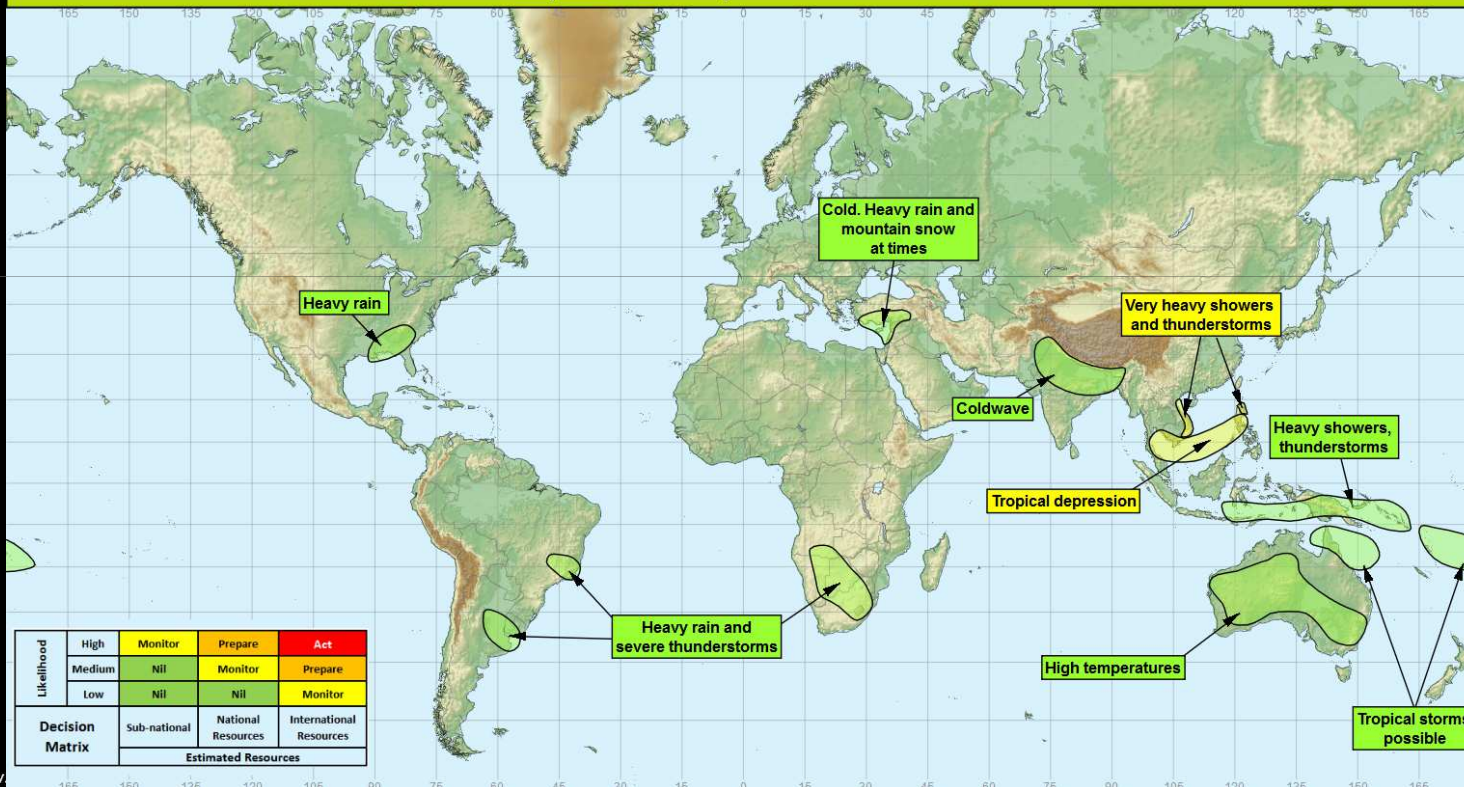
Wind – Tropical Storms

Tuesday 01 January 2019



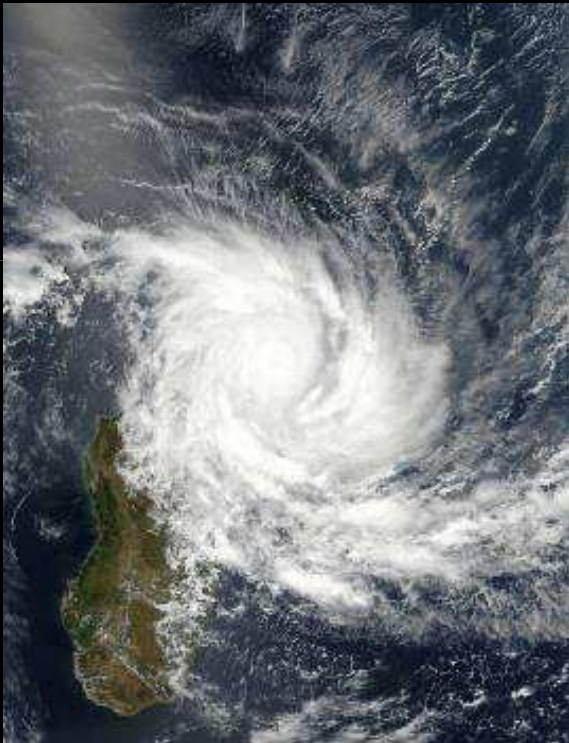
Severe Weather Daily monitoring

Aristotle Impacts Summary – 29 Dec 2018 to 04 Jan 2019





Severe Weather Case Study : Tropical Cyclone Enawo – March 2017



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- Intense Tropical Cyclone affected NE Madagascar early March 2017
- Sustained winds 110kt (203km/hr)
- 186mm rain recorded in 6hrs
- The NE sustained significant damage to housing and agriculture
- Antalaha port was inaccessible with more than half the City's homes destroyed
- Severe flooding (up to 4 meters) in the NE, with 2 schools destroyed
- Humanitarian support was requested but was managed by in-country teams.

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

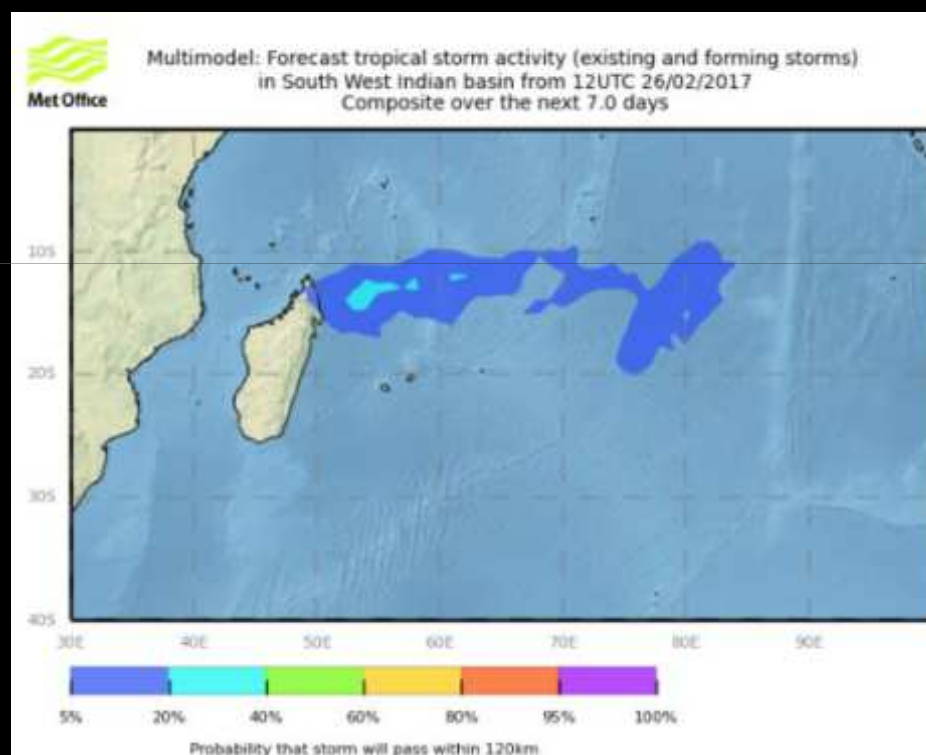
Multi-model forecast of
Tropical Storm Activity

9 days before landfall

Monitor Add to situational report	Prepare If possible multi- hazard impact call MHCB	Warn Call the local authorities to prepare
No action required	Monitor Add to situational report	Prepare Call MHCB seek advice on assistance
No action required	No action required	Monitor Add to situational report

Severe Weather
Hazard Group notified

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

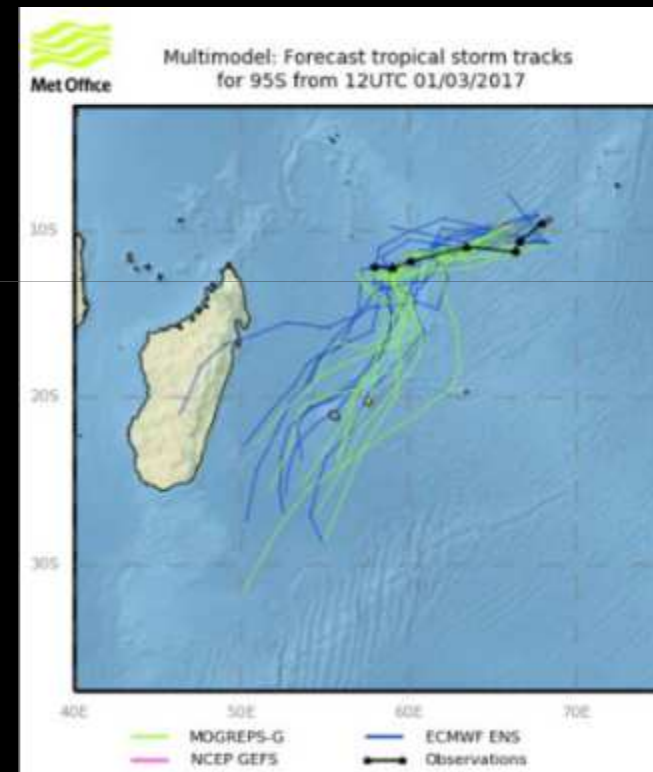
Multi-model forecast Tropical
Storm Tracks

6 days before landfall

Monitor Add to situational report	Prepare If possible multi- hazard impact call brief	Alert Call MHOE Responsible personnel briefed
No action required	Monitor Add to situational report	Prepare Call MHOE seek advice on escalation
No action required	No action required	Monitor Add to situational report

Severe Weather
Hazard Group notified

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

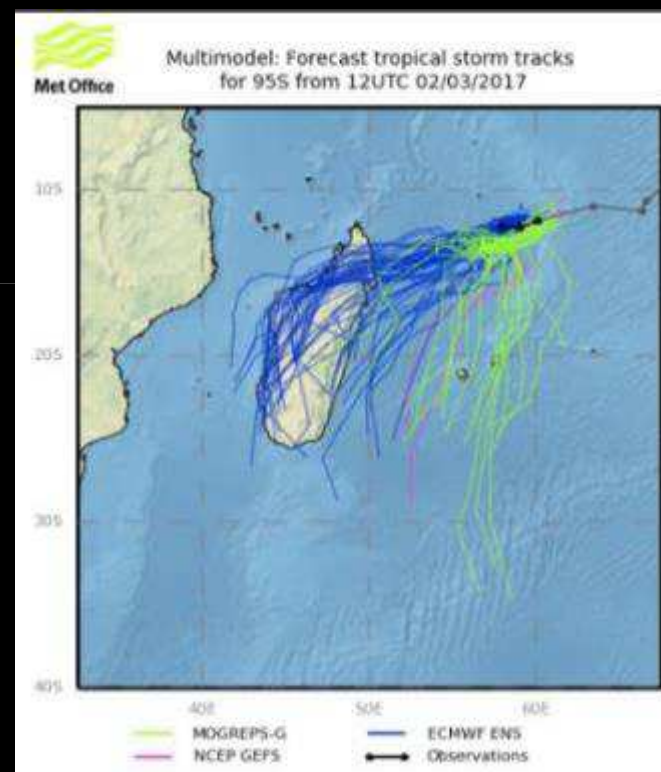
Multi-model forecast Tropical
Storm Tracks

5 days before landfall

Monitor Add to situational report	Prepare if possible initiate hazard impact call WHOP	Alert Call WHOP Prepare for evacuation
No action required	Monitor Add to situational report	Prepare Call WHOP seek advice on evacuation
No action required	No action required	Monitor Add to situational report

Severe Weather Hazard
Group pre-alerts

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

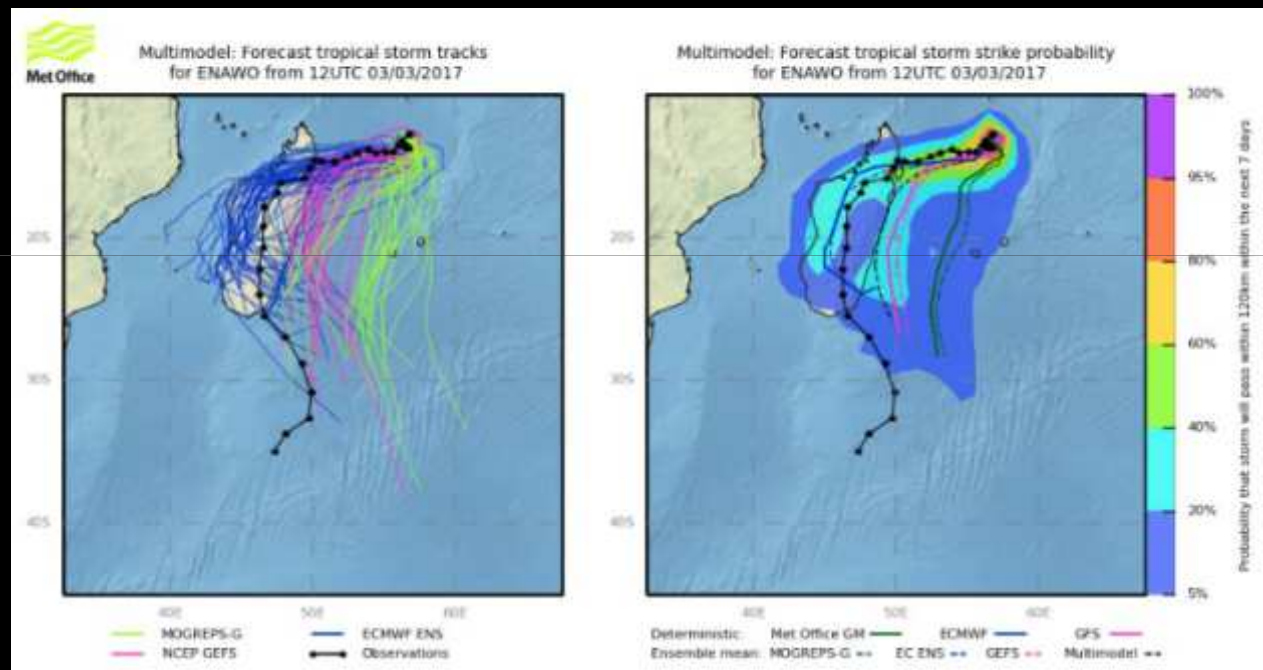
Multi-model forecast
Tropical Storm Tracks
(left) and Strike
Probability (right)

4 days before landfall

Monitor Add to situational report	Prepare If possible visit hazard impact cell MHOB	Alert Issue warnings Issue warnings Issue warnings
No action required	Monitor Add to situational report	Prepare Call MHOB seek advice on escalation
No action required	No action required	Monitor Add to situational report

ERCC notified, decline
EMR

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

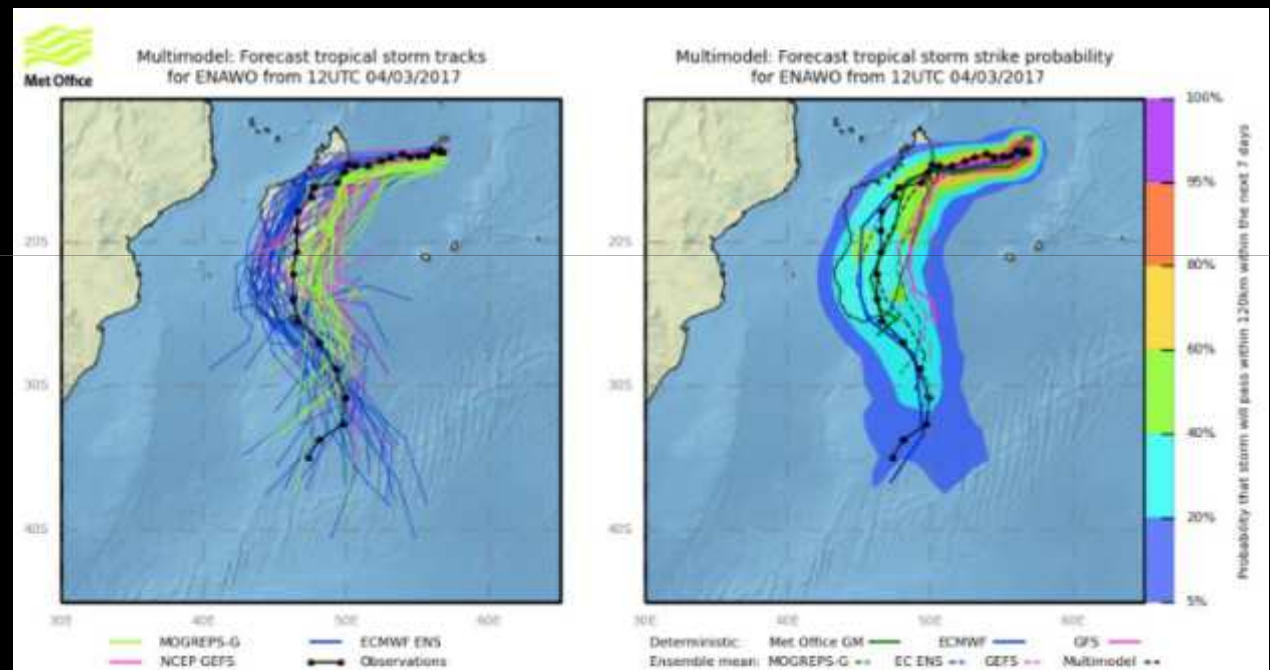
Multi-model forecast
Tropical Storm Tracks
(left) and Strike
Probability (right)

3 days before landfall

Monitor Add to situational report	Prepare If possible multi hazard impact call MHOB	Alert Call MHOB Escalate to JMW
No action required	Monitor Add to situational report	Prepare Call MHOB seek advice on escalation
No action required	No action required	Monitor Add to situational report

ERCC re-notified, trigger EMR

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Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

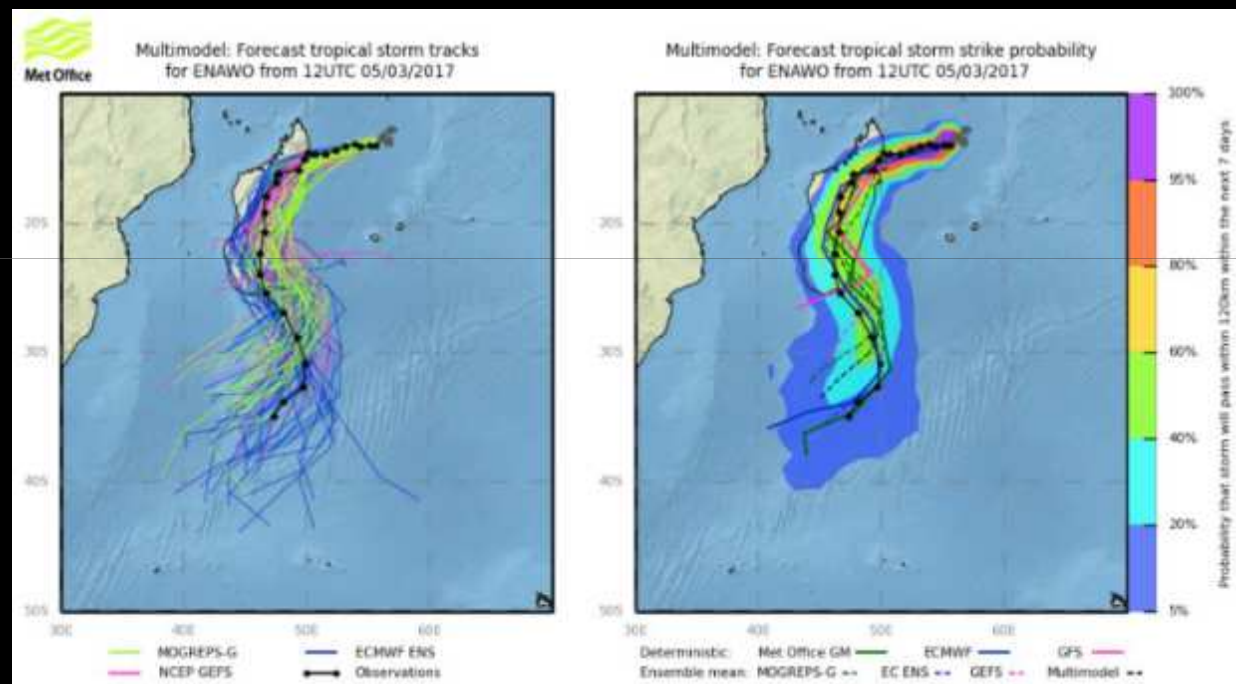
Multi-model forecast
Tropical Storm Tracks
(left) and Strike
Probability (right)

2 days before landfall

Monitor Add to situational report	Prepare If possible MHOBS forward report call MHOBS	Act Call MHOBS Recommend Escalation to ERM
No action required	Monitor Add to situational report	Prepare Call MHOBS peak escalation
No action required	No action required	Monitor Add to situational report

ERCC re-activate

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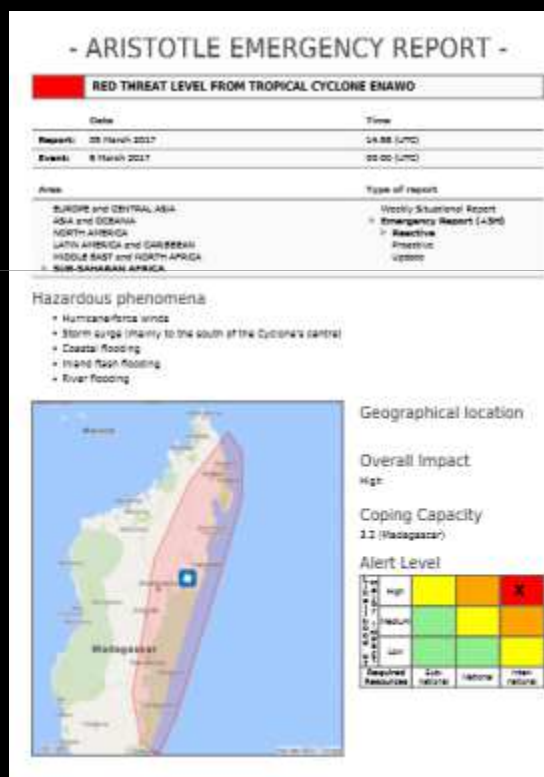
Severe Weather Case Study : Tropical Cyclone Enawo – March 2017

Multi-hazard report
issued to ERCC

Focus on impacts
across NE
Madagascar

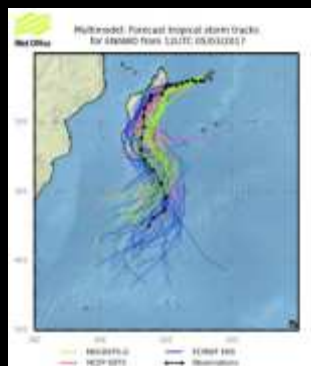
Report updated next
day 24 hours ahead
of landfall

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wright

Summary



Likelihood	High	Monitor	prepare	Act
	Medium	nil	monitor	prepare
	Low	nil	nil	monitor
Decision Matrix		Sub-national	National Resources	International Resources
		Estimated resources		





Met Office

Any questions ?

Many thanks to:

Jenny Rourke, Gavin Iley, Anton Muscat, the ERCC and
all of the many ARISTOTLE members

